

REMARKS

Reconsideration of the application is requested.



Claims 1-20 remain in the application. Claims 1-17 are subject to examination and claims 18-20 have been withdrawn from examination.

Under the heading "Claim Rejections - 35 USC § 103" on pages 2-4 of the above-identified Office Action, claims 1-7, 16 and 17 have been rejected as being obvious over International Patent Disclosure WO 00/59501 to Hehn et al. (hereinafter Hehn) in view of U.S. patent No. 5,962,905 to Kamiguchi et al. (hereinafter Kamiguchi) under 35 U.S.C. § 103.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and, therefore, the claims have not been amended to overcome the references.

Claims 1, 16 and 17 of the instant application recites, inter alia:

a first contact made of a semi-magnetic material;

a non-magnetic semiconductor layer;

a tunnel barrier; and

a second contact.

Claims 1, 16 and 17 further recites that the non-magnetic semiconductor layer is configured between the first and second contacts. Therefore we have at least one interface between the semi-magnetic material of the first contact and the non-magnetic semiconductor layer.

As the Examiner notes, the structure of Hehn recites:

a first contact (1, 3);

a non-magnetic semiconductor layer (2, 4);

a tunnel barrier (2, 4); and

a second contact (3, 5), and the contacts are made of a semi-metallic material.

The Examiner notes that Hehn does not teach forming the first and second contacts from a semi-magnetic material and relies on Kamiguchi for teaching this feature.

The structure described in Kamigushi is as follows:

a first semiconductor layer (3) of a first conductivity type (n);

a second semiconductor layer (2) of a second conductivity type (p);

a third semiconductor layer of the first conductivity type;

a first ferromagnetic layer (5) formed in contact with the first semiconductor layer (3) of the first conductivity type; and

a second ferromagnetic layer (1) formed in contact with the second semiconductor layer (2) of the second conductivity type (see column 2, lines 12-20 and column 3, lines 3-12).

Kamiguchi further teaches that preferably the semiconductor layer and the ferromagnetic layer form an ohmic contact and therefore that the semiconductor layer is disposed between the two ferromagnetic layers (see column 4, lines 33-37).

In the Office Action, the Examiner states that Kamiguchi teaches that as a material for the semiconductor layer, a semi-magnetic material can be used (see column 4, lines 46-49). However, in this case an interface is formed between the semi-magnetic layer and the ferromagnetic layer. This is obviously different from an interface according to the invention of a semi-magnetic layer and a non-magnetic semiconductor layer. Therefore, even if a person of average skill in the art would combine Hehn with Kamiguchi, he/she would exchange the semi-metallic layer of Hehn with the ferromagnetic layer of Kamiguchi and the semiconductor layer of Hehn with a semi-magnetic layer of Kamiguchi resulting in the structure of:

a first contact made of a ferromagnetic material;

a semi-magnetic semiconductor layer;

a tunnel barrier; and

a second contact made of a ferromagnetic material.

This combination does not read on claims 1, 16 or 17 of the instant application. It is respectfully stated that one may only combine references for what they teach and how the

references state how a desired combination would occur and not in hindsight of the invention. Applicants respectfully believe that any teaching, suggestion, or incentive possibly derived from the prior art is only present with hindsight judgment in view of the instant application. "It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps. . . . The references **themselves** must provide some teaching whereby the applicant's combination would have been obvious." In re Gorman, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (emphasis added). Here, no such teaching is present in the cited references.

The Examiner notes the importance of the ferromagnetic layer when he states "And the ferromagnetic layer and the semiconductor layer form ohmic contact in order to enhance the injection efficiency of spin-polarized carriers from the ferromagnetic layer into the semiconductor layer . . .". Therefore, the invention in Kamiguchi requires the incorporation of the complete combination as noted above.

It is further noted that Hehn clearly states that the polarization of the semi-metallic material is 100% and teaches against the invention of the instant application (see

page 5, lines 4-6 of Hehn) which requires some degree of non-polarization. One cannot incorporate features into Hehn which run against the overriding teaching Hehn as this would be an impermissible combination as noted in MPEP 2145.

In view of the above arguments, the Examiner is respectfully requested to withdraw the 35 U.S.C. § 103 rejection based on Hehn and Kamiguchi.

On pages 4 and 5 of the Office Action, claims 8-9 have been rejected as being obvious over Hehn in view of Kamiguchi and further in view of the article by Fiederling R., et al. under 35 U.S.C. § 103.

As noted above Hehn and Kamiguchi are not believed to teach the features of claim 1 and therefore claims 8 and 9 are also believed to be allowable as they depend from claim 1.

On pages 5 and 6 of the above-identified Office Action, claims 10-11 have been rejected as being obvious over Hehn in view of Kamiguchi and further in view of U.S. Patent No. 5,640,343 to Gallagher et al. (hereinafter Gallagher) under 35 U.S.C. § 103.

As noted above Hahn and Kamiguchi are not believed to teach the features of claim 1 and therefore claims 10 and 11 are also believed to be allowable as they depend from claim 1.

It is appreciatively noted that claims 12-15 are allowed.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1, 16 or 17. Claims 1, 16 and 17 are, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

In view of the foregoing, reconsideration and allowance of claims 1-20 are solicited.

If an extension of time is required, petition for extension is herewith made. Any extension fee associated therewith should be charged to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner

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and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

For Applicants

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